Continental
The Future in Motion

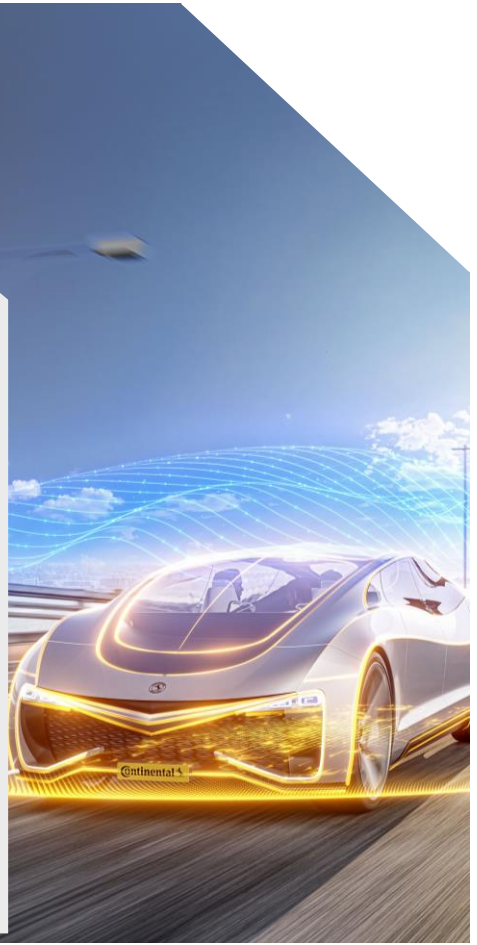
Continental AECS Master

Automotive Electronic Control Systems

29.06.2023 – Facultatea de Electronica , Telecomunicatii si Tehnologia Informatiei

Continental AECS Master in a nutshell

- be prepared to become a professional in the automotive industry and learn about the last technical trends in the field;
- updated curricula and continuous improvement of learning materials
- trainers with practical experience in the automotive industry
- hands-on learning experience



Your future career
in the automotive industry awaits you.

Automotive © Continental AG

Continental AECS Master
Main goals

- The Master Program has been developed by Technical University "Gheorghe Asachi" of Iasi, Faculty of Electronics, Telecommunications and Information Technology in partnership with Continental Automotive Romania.

- The Automotive Embedded Control Systems program of study was introduced to cater industry's demand for highly skilled graduates in advanced areas of analysis, design and manufacture in the automotive industry.

- The master program is specifically focused to cover a wide range of advanced subjects across automotive engineering and to develop student skills in engineering design, software engineering, embedded systems and control engineering.

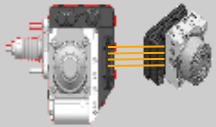
Products Continental, Iasi

BA Safety and Motion

Suspension ECUs

Electric Vacuum Pump

Brake By Wire Systems MK C1, MK C2



HAD Brake Systems

BA Autonomous Mobility

Assisted and Automated Driving Control Unit

Crusing Functions

Parking Functions

BA User Experience

Fiat VPx

PSA WaveX

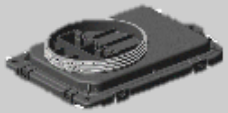
OIP

BMW Gen5 IC Box

Products Continental, Iasi

BA
Smart Mobility

Sunroof



Front Light Control Units

Rear Light Control Units

Power Door

BA
Architecture and Networking

PSA BSRF

Daimler Ramses TCU

VW ICAS

Volvo TCAM

SCT
Software and Central Technologies

House of Solutions (PMT)

Overall CASE Concept

Project: ASPICE Data Collector

Mandatory Discipline

Elective Diciplines

Facultative Disciplines

Continental AECS Master 1

Automotive Electronic Control Systems

Semester 1
An I

Vehicle Electronics System

Course

Overview

Focus:

Complete overview of architecture and systems from the car as Sensors, Drivers, Instrumentation or Diagnosis

Embedded Signaling, Communication and Networking

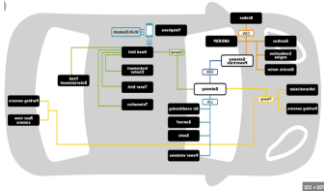
Course

Laboratory

Overview

Focus:

Overview of communication and networking protocols used in the cars as CAN , LIN , Ethernet



Embedded Systems Engineering and Testing

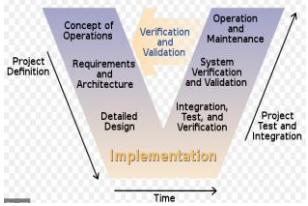
Course

Laboratory

Overview

Focus:

Overview of defining and test a system as intended and to meet customer expectations.



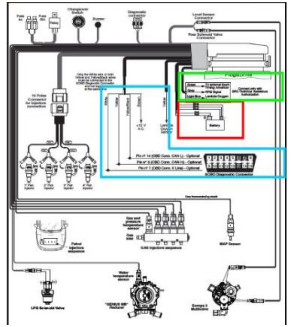
Electronics for Automotive Systems

Laboratory

Overview

Focus:

Practical aspects of Electronic Components, Electronic Circuits Architecture and Design inside Automotive Systems.



Continental AECS Master 1

Automotive Electronic Control Systems

Mandatory Discipline

Elective Diciplines

Facultative Disciplines

Semester 1
An I

Programming Embedded Systems

Course

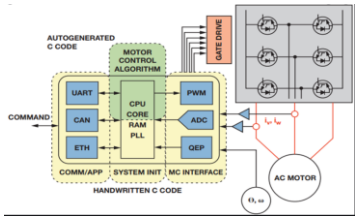
Laboratory

Practice

Overview

Focus:

Practical aspects of basic programming and microcontroller architecture used to build car systems



Programming DSP for Embedded and Real time Systems

Course

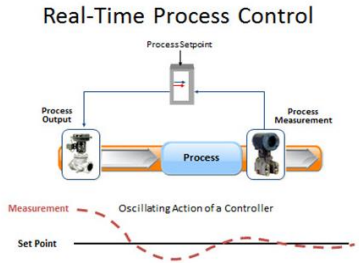
Laboratory

Practice

Overview

Focus:

Aspects of techniques and technologies for designing and implementing an optimal embedded system with Digital Signal Processing programming



Social Competence & Interpersonal Skills in organization environment

Course

Laboratory

Overview

Focus:

Aspects of personal development and social competences as Communication Skills, Presentation Skills, Time Management, etc

Mandatory Discipline

Elective Diciplines

Facultative Disciplines

Continental AECS Master 1

Automotive Electronic Control Systems

Semester 2
An I

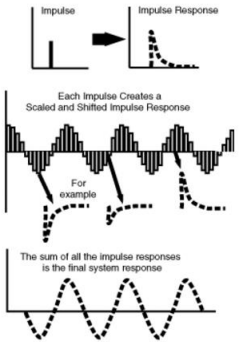
Vehicle Control Systems

Course

Overview

Focus:

Complete overview of the mechanisms and concepts as of control vehicle electronic systems.



Embedded System Design and Modeling

Course

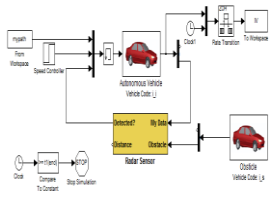
Laboratory

Practice

Overview

Focus:

Practical model Based Development with Matlab protocols



Programming Embedded Systems 2

Course

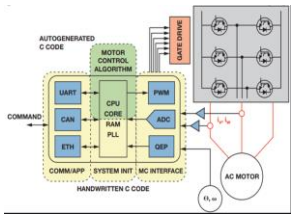
Laboratory

Practice

Overview

Focus

Practical aspects of advance programming and microcontroller architecture used to build car systems



Hardware Development of Automotive Electronic Systems

Course

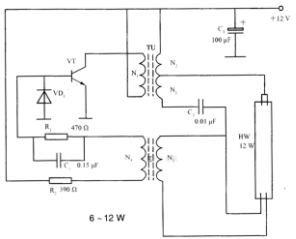
Laboratory

Practice

Overview

Focus:

HW Development of Embedded Systems and practical aspects of electronics dispositive and circuits



Automotive Power Electronics

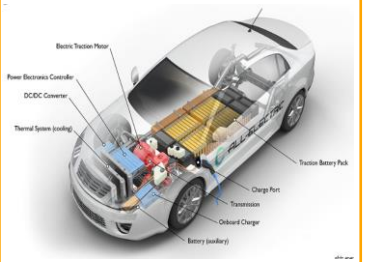
Course

Laboratory

Overview

Focus:

Systems and practical aspects of Voltage regulators, Power supply, Inverters and how are this integrated in the car



Mandatory Discipline

Elective Diciplines

Facultative Disciplines

Continental AECS Master 1

Automotive Electronic Control Systems

Semester 2
An I

Project Management of Automotive Systems

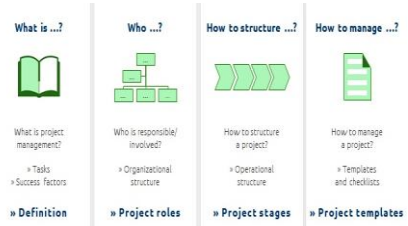
Course

Practice

Overview

Focus :

Complete overview of the project management activities and steps followed to manage a project from technical and resources point of view



Mandatory Discipline

Elective Diciplines

Facultative Disciplines

Continental AECS Master 2

Automotive Electronic Control Systems

Semester 1
An II

Cybersecurity for Automotive Systems

Course

Overview

Focus:

Complete overview of Cybersecurity aspects as Security standards and Hacking methods in a world where car is connected to everything

Automotive Connected Mobility

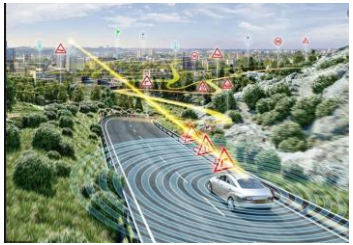
Course

Laboratory

Overview

Focus:

Complete overview of connectivity aspects as Inter-vehicle communication, Access technologies , 3rd Party



Signal Processing for Vehicular Technologies

Course

Laboratory

Practice

Overview

Focus:

Complete overview of signal processing for monitoring driver distraction, vehicle lane/control detection/tracking and

Machine Learning for Automotive Systems

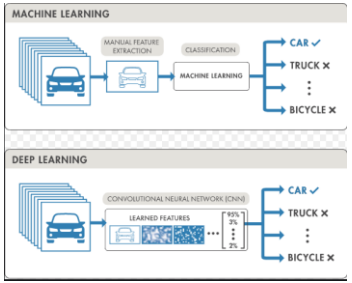
Course

Laboratory

Overview

Focus:

Complete overview of Machine learning models and how are applied in automotive systems



Mandatory Discipline

Elective Diciplines

Facultative Disciplines

Continental AECS Master 2

Automotive Electronic Control Systems

Semester 1
An II

High Level embedded programing for Automotive Systems

Course

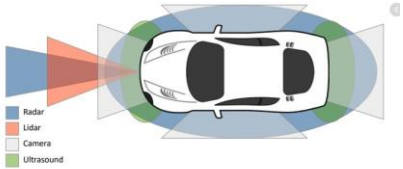
Laboratory

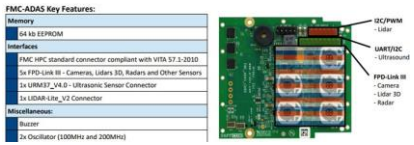
Practice

Overview

Focus:

Practical aspects of advance programming and complex microcontroller architecture used to build complex car systems (Autonomous Driving)





Advanced Java Programming

Course

Laboratory

Practice

Overview

Focus:

Practical aspects of advance programming with Java for new mobility technologies

Mandatory Discipline

Elective Diciplines

Facultative Disciplines

Continental AECS Master 2

Automotive Electronic Control Systems

Semester 2
An II

Reconfigurable Automotive Systems

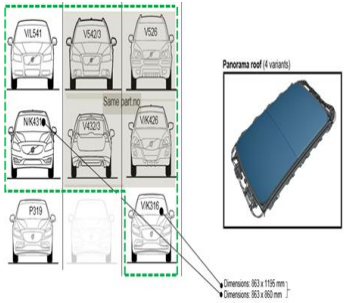
Course

Laboratory

Overview

Focus:

Complete overview of designing and implementing systems that can be easy re-config or re-used over life time



Automotive Electromagnetic Compatibility

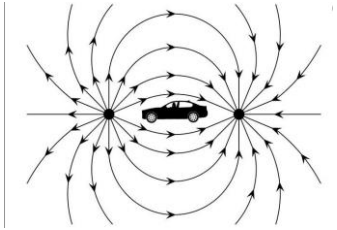
Course

Laboratory

An II **Overview**

Focus:

Complete overview of designing patters to create systems that are compliance with EMC and EMI laws and standards



Functional Safety Reliability of Embedded Systems

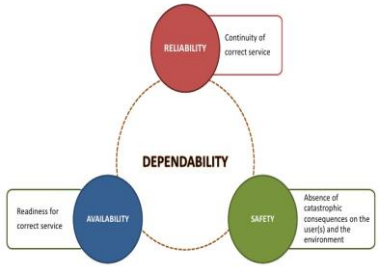
Course

Seminary

Overview

Focus:

Complete overview and understand ISO26262 to can create safe systems for cars users .



Dissertation work

Practice

Overview

Future Career Opportunities

System	Software	Hardware	Mechanical	Testing	Quality
System Engineer Function Developer Requierements Engineer System Architect Safety and Privacy Analyst Functional Safety Engineer	Software Architect Software Developer DevOps Engineer Software Integrator Full Stack Developer	Hardware Developer Engineer Hardware Design Engineer Hardware Test Engineer Hardware Engineer	Mechanical Design Engineer Mechanical Engineer	System Test Engineer Software Test Engineer Test Automation Engineer	Software Quality Engineer Quality Engineer Quality Manager in Project
Knowledge of Electronics, programming	**Programming in C++, C, Python, Java, Knowledge of Microcontrollers, MATLAB**	**Knowledge of electronics, PCB, Sensors, electrical measuring devices (Multimeter/oscilloscope/signal generator), Knowledge of measuring devices (eq. micrometer)**	**Catia V5/V6, Auto Cad, Technical drawing, Material Strength, GD&T (tolerance calculations)**	**Software and system testing, types of testing (white box/black box)/test methods, manual and automation testing, C fundamentals, testing technics, Microcontrollers fundamentals, electrical measuring devices)**	**Quality standards in automotive, quality ASPICE standards**